



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,157	08/01/2008	Minoru Hirata	04632.0072	4857
22852	7590	07/19/2011		
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER YUEN, JACKY	
			ART UNIT 1735	PAPER NUMBER
			MAIL DATE 07/19/2011	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/586,157

Applicant(s)

HIRATA, MINORU

Examiner

Jacky Yuen

Art Unit

1735

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-27 is/are pending in the application.
- 4a) Of the above claim(s) 21, 22, 24 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-20, 23, 25 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date 10/16/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II, claims 13-27, and species d1, e1, and f1 in the reply filed on 6/23/2011 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 13-27 are pending. Claims 21, 22, 24, and 26 are withdrawn as being directed to the non-elected species.

Claim Objections

2. Claim 13 is objected to because of the following informalities: lines 12-13 recite "pressuring member" which should be changed to --pressing member-- to be consistent with the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 16 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Regarding claim 16, it is noted that claim 16 requires said pressing is carried out before said flask unit is moved. However, it is unclear how that is performed as claim 13 has recited

that the pressing step presses introduced molding sand, therefore the pressing step occurs after said introducing step. In claim 14, it is noted that said flask unit is moved between a position where defining is carried out and where introducing is carried out. Thus, as pressing occurs after introducing, the flask unit has already moved, it is unclear how pressing can be carried out before said flask unit is moved. For examination purposes, the limitation will be treated such that said pressing is carried out before said flask unit is further moved, or moved away from said position where said introducing step is carried out.

Regarding claim 27, the phrase "wherein said half-molds are poured before said half-molds are removed from said flasks" is indefinite as it is unclear how "half-molds are poured". However, for examination purposes, the limitation will be treated such that molten metal is poured into said half-molds before said half-molds are removed from said flask.

Means-Plus-Function Language

A claim limitation will be presumed to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:

- (A) the claim limitations must use the phrase "means for" or "step for";
- (B) the "means for" or "step for" must be modified by functional language; and
- (C) the phrase "means for" or "step for" must not be modified by sufficient structure, material, or acts for achieving the specified function. (MPEP 2181)

Claim limitation "pressing members for pressing molding sand" has been interpreted under 35 U.S.C. 112, sixth paragraph, because it uses a non-structural term "members" coupled

with functional language “for pressing molding sand” without reciting sufficient structure to achieve the function. Furthermore, the non-structural term is not preceded by a structural modifier.

Since this claim limitation invokes 35 U.S.C. 112, sixth paragraph, claim 13 is interpreted to cover the corresponding structure described in the specification that achieves the claimed function, and equivalents thereof.

A review of the specification shows that the following appears to be the corresponding structure described in the specification for the 35 U.S.C. 112, sixth paragraph limitation: see specification page 9 lines 25-30, pressing means are the squeezing plates.

If applicant wishes to provide further explanation or dispute the examiner’s interpretation of the corresponding structure, applicant must identify the corresponding structure with reference to the specification by page and line number, and to the drawing, if any, by reference characters in response to this Office action.

If applicant does **not** wish to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant may amend the claim so that it will clearly not invoke 35 U.S.C. 112, sixth paragraph, or present a sufficient showing that the claim recites sufficient structure, material, or acts for performing the claimed function to preclude application of 35 U.S.C. 112, sixth paragraph.

For more information, see *Supplementary Examination Guidelines for Determining Compliance with 35 U.S.C. § 112 and for Treatment of Related Issues in Patent Applications*, 76 FR 7162, 7167 (Feb. 9, 2011).

The phrase “driving means for driving said pair of pressing members” as recited in claim 19 properly invokes 35 U.S.C. 112 6th paragraph and will be interpreted as cylinders (see specification page 9 lines 25-30).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 13, 17, 18, 23 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Shioda (US 4,411,303).

Regarding claim 13, Shioda teaches a method for molding a mold (col 1 lines 5-10, producing flaskless sand molds) using a flask unit (see fig 1, flask assembly 20, col 3 lines 15-25) to be incorporated in a flaskless molding machine (see fig 1, col 2 lines 30-35, match plate molding apparatus) that has a pair of pressing members for pressing molding sand (fig 1, col 3 lines 30-40, squeeze plates 24,25), wherein the flask unit is formed of a pair of flasks for containing molding sand (fig 1, flasks 11,12), wherein each flask comprises a body (see fig 1, flasks 11,12, dotted lines define the body and opening) that defines an opening in which a sand mold is to be molded (fig 1, flasks 11,12, dotted lines define the body and opening, see figs 7-8 to see body and opening), said body having an inlet for introducing said mold sand into said opening (see fig 1, supply ports 30), and a mounting member attached to said body (fig 1-2,

bases 9 and 10) for mounting said flask on a plurality of connecting arms (figs 1-2, guide rods 8) that are adapted to integrally connect one flask to another flask such that the one flask and the other flask are opposed to and spaced apart from each other (see figs 1-2), while they are supported by said connecting arms (fig 1-2, supported by guide rods 8), said method comprising the steps of: defining a pair of molding spaces by inserting each pressing member into each opening of said pair of flasks that is formed from said flask unit (see figs 1-2, col 4 line 60 – col 5 line 7, squeeze plates 24,25 enter into molding flasks 11,12 and come to predetermined positions within the flasks); introducing said molding sand into said pair of molding spaces through said inlets (col 5 lines 5-22, molding sand is supplied into the molding cavities through supply ports 30); and molding two half molds by pressing said introduced molding sand with said pressing members (col 5 lines 20-40, squeeze plate 24 is advanced into molding flask 11).

Regarding claim 17, Shioda teaches wherein it further comprises a step of moving said pair of half-molds in said flask unit to a position where a core is to be fitted within each half-mold after said pressing step (fig 1, col 6 lines 10-30, flask device 4 is rotated so that flask assembly is brought into the mold removing station, where insertion of a core into the sand mold within the molding flask 11 is performed, subsequent jointing of the molds within both flasks is conducted, thus the core is fitted within each half-mold).

Regarding claim 18, Shioda teaches wherein it further comprises a step of moving said pair of half-molds in said flask unit to a position where said mold is removed (fig 1, col 6 lines 5-20, flask device 4 is rotated so that flask assembly 20 is brought into the mold-removing station).

Regarding claim 23, Shioda teaches wherein said defining step simultaneously defines said pair of molding spaces (see figs 1-2, col 4 line 63-col 5 line 7, appears to describe the plates being moved together).

Regarding claim 25, Shioda teaches wherein said defining step is completed before said introducing step (col 5 lines 1-20, molding cavities are defined as a result of the stopping of the squeeze plates, and then at this stage, sand is supplied, thus introducing after defining).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 13-20, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knudsen (US 6,499,531) in view of Shioda.

Regarding claim 13, Knudsen teaches a method for molding a mold (abstract) using a flask unit (abstract, assembly including cope flask and drag flask) to be incorporated in a flaskless molding machine (abstract, molding machine for producing flaskless molds) that has a pair of pressing members for pressing molding sand (col 4 lines 25-40, first and second squeeze plates 5,6), wherein the flask unit is formed of a pair of flasks for containing molding sand (abstract, cope flask and drag flask), wherein each flask comprises a body that defines an

opening in which a sand mold is to be molded (each flask has a body, col 4 lines 25-45, the mould-half forming space is the opening), said body having an inlet for introducing said mold sand into said opening (sand charging openings 11,12), said method comprising the steps of: defining a pair of molding spaces by inserting each pressuring member into each opening of said pair of flasks that is formed from said flask unit (col 4 lines 25-40, first squeeze plate inserted into cope flask, second squeeze plate inserted into drag flask); introducing said molding sand into said pair of molding spaces through said inlets (col 4 lines 35-45, mold half forming spaces are filled with sand through sand-charging openings 11,12); and molding two half molds by pressing said introduced molding sand with said pressing members (col 4 lines 45-60, charged sand is compacted by the pressure plates 5,6 being forced into flasks).

Knudsen fails to teach a mounting member attached to said body for mounting said flask on a plurality of connecting arms that are adapted to integrally connect one flask to another flask such that the one flask and the other flask are opposed to and spaced apart from each other, while they are supported by said connecting arms.

Shioda teaches a flaskless molding apparatus where said flasks can be attached to bases 9 and 10 for mounting flasks axially slidable on guide rods 8 (col 2 lines 30-55 and figures 1-2).

In view of the teachings of Shioda, it would have been obvious to include the assembly of the flasks as disclosed in Shioda, including guide rods and bases 9 and 10, in order to support and guide the molding flasks and provide accurate alignment of the halves.

Regarding claim 14, Knudsen teaches wherein it further comprises a step of moving said flask unit between a position where said defining step is carried out and a position where said

introducing step is carried out (col 4 lines 25-45, squeeze plates are inserted and components are in alignment, thus a step of defining, then the frame is rotated to a vertical position, then the flasks are filled with sand).

Regarding claim 15, Knudsen teaches wherein said pressing step is carried out on a path on which said moving flask unit is moved (col 4 lines 45-65, compacting occurs after filling with sand, which occurred after rotating, thus the pressing step is carried out on a path where flask is moved).

Regarding claim 16, Knudsen teaches wherein said pressing that is carried out on said path is carried out before said flask unit is *further* moved (col 4 lines 35-65, filled with sand, compacted, then rotated after a predetermined time interval after squeezing is completed).

Regarding claim 17, Knudsen teaches of a step of moving said pair of half-molds in said flask to a position where said mold is removed (col 4 line 60-65), but is quiet to fitting cores while being in said moved position. However, Shioda teaches that a core can be inserted into said mold in the mold removing station (col 6 lines 8-27, jointing of molds thus fits the core within each half-mold). The use of cores in molds for casting is well known, and would have been obvious to one of ordinary skill in the art to include.

Regarding claim 18, Knudsen teaches a step of moving said pair of half-molds in said flask unit to a position where said mold is removed (col 4 lines 60-65, after squeezing, rotated to

starting position, col 5 lines 10-25, squeeze plate 5 is lowered to separate cope and drag from flasks).

Regarding claim 19, Knudsen teaches wherein said flaskless molding machine includes a rotation frame (swing frame 2) for moving said flask unit between a position where said defining step is carried out and a position where said introducing step is carried out (see rejection of claim 14), and a pair of driving means for driving said pair of pressing members, respectively (first linear actuator 7, preferably hydraulic actuation, for moving first squeeze plate up and down, col 3 lines 5-15, third actuation in the form of hydraulic cylinder for moving second squeeze plate up and down, col 3 lines 30-40).

Regarding claim 20, Knudsen teaches wherein said driving means are moved with said rotation frame in unison (see figs 1, 4.1, and 7, actuators 7 and 13a rotate as swing frame rotates, actuators are also connected to swing frame, see col 3 lines 5-15 and lines 30-40).

Regarding claim 23, Knudsen teaches wherein said defining step simultaneously defines said pair of molding spaces (col 4 lines 24-37, in this state, squeeze plate 5 is inserted into flask 3 and squeeze plate 6 is inserted into flask 4, and all components are in alignment, thus showing defining simultaneously).

Regarding claim 25, Knudsen teaches wherein said defining step is completed before said introducing step (col 4 lines 30-45, the first squeeze plate and the second squeeze plate are

inserted, thus defined, rotated, and then the spaces in the flasks are filled with sand, thus defining is completed before introducing).

9. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Knudsen as modified by Shioda as applied to claim 13 above, and further in view of Kaneto et al (US 5,409,052).

Regarding claim 27, the combination fails to teach wherein said half-molds are poured before said half-molds are removed from said flask.

However, Kaneto et al teaches a similar method of forming molds, where Kaneto et al recognizes that similarly to conventional molding, processes such as removing the match plate, mating the cope and drag molds, casting, and removing a cast product and sand from the flasks are carried out (col 3 lines 5-11). It is noted that since a cast product and sand is removed from the flasks, casting occurred prior to removal from the flasks.

In view of the teachings of Kaneto et al, it would have been obvious to cast (pour molten metal into the mold) before removing from said flask, as Kaneto et al recognizes the process as conventional (see col 3 lines 5-11).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Murata (US 5,246,058) teaches of a flaskless molding machine where flasks are arranged to be rotated between a horizontal position and a vertical position; Fellows (US

3,589,431) teaches a flaskless molding apparatus where molds are moved to a different station where cores are inserted and fitted within each half-mold (see figs 20-21).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacky Yuen whose telephone number is (571)270-5749. The examiner can normally be reached on Monday - Friday, 9:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacky Yuen/
Examiner, Art Unit 1735

/JESSICA L. WARD/
Supervisory Patent Examiner, Art Unit 1735